

WHAT IS CLAIMED IS:

1. A bar-code reader comprising:

an optical scanner that optically scans a bar code to obtain
signal strength of light reflected from black bars and white bars of the
5 bar code;

an extracting unit that extracts edge data, which includes a
plurality of edges and the signal strength of which changes
corresponding to a change from a black bar to a white bar and vice
versa;

10 an edge-emphasizing unit that emphasizes edge data of an
edge that satisfies a predetermined condition;

a ternary judgment unit that makes a ternary judgment of each
edge based on the edge emphasized to obtain a ternarizing result; and

a decoder that decodes bar-code characters from the ternarizing
15 result.

2. The bar-code reader according to claim 1, wherein the
edge-emphasizing unit emphasizes the edge when a thick black bar or
a thick white bar is detected in the bar code.

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3. The bar-code reader according to claim 2, wherein the
edge-emphasizing unit emphasizes an amplitude of the edge based on
an excessive width of a black bar or a white bar in the bar code.

25 4. The bar-code reader according to claim 1, wherein the

edge-emphasizing unit emphasizes an amplitude of the edge, when the edge data is expressed in a waveform with time on a horizontal axis and an amplitude on a vertical axis, and when an edge having an amplitude greater than a predetermined threshold value is detected.

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5. The bar-code reader according to claim 1, wherein the edge-emphasizing unit emphasizes an amplitude of the edge, when the edge data is expressed in a waveform with time on a horizontal axis and an amplitude on a vertical axis, and when an edge having a frequency of a module greater than a predetermined threshold value is detected.

6. The bar-code reader according to claim 5, wherein the edge-emphasizing unit causes a change in emphasizing characteristics that emphasize the amplitude of the edge, based on the frequency of the module.

7. The bar-code reader according to claim 1, wherein the edge-emphasizing unit emphasizes the edge using a transversal filter in which filter characteristics are set by setting a tap coefficient.

8. A method of reading a bar code comprising:
optically scanning a bar code to obtain signal strength of light reflected from black and white bars of the bar code;
extracting edge data, which includes a plurality of edges and the

signal strength of which changes corresponding to a change from a black bar to a white bar and vice versa;

emphasizing an edge from the edge data;

making a ternary judgment for each edge based on the edge

5 emphasized to obtain a ternarizing result; and

decoding bar-code characters from the ternarizing result.

9. The method according to claim 8, wherein the emphasizing includes emphasizing the edge when a thick black bar or a thick white
10 bar is detected in the bar code.

10. The method according to claim 9, wherein the emphasizing includes emphasizing an amplitude of the edge based on an excessive width of a black bar or a white bar in the bar code.

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11. The method according to claim 8, wherein the emphasizing includes emphasizing an amplitude of the edge, when the edge data is expressed in a waveform with time on a horizontal axis and an amplitude on a vertical axis, and when an edge having an amplitude
20 greater than a predetermined threshold value is detected.

12. The method according to claim 8, wherein the emphasizing includes emphasizing an amplitude of the edge, when the edge data is expressed in a waveform with time on a horizontal axis and an
25 amplitude on a vertical axis, and when an edge having a frequency of a

module greater than a predetermined threshold value is detected.

13. The method according to claim 12, wherein the emphasizing further includes causing a change in emphasizing characteristics that
5 emphasize the amplitude of the edge, based on the frequency of the module.

14. The method according to claim 8, wherein the emphasizing includes emphasizing the edge using a transversal filter in which filter
10 characteristics are set by setting a tap coefficient.

15. A computer program for reading a bar-code that makes the computer execute:

optically scanning a bar code to obtain signal strength of light
15 reflected from black and white bars of the bar code;

extracting edge data, which includes a plurality of edges and the signal strength of which changes corresponding to a change from a black bar to a white bar and vice versa;

emphasizing an edge from the edge data;
20 making a ternary judgment of each edge based on the edge emphasized to obtain a ternarizing result; and

decoding bar-code characters from the ternarizing result.

16. The computer program according to claim 15, wherein the
25 emphasizing includes emphasizing the edge when a thick black bar or a

thick white bar is detected in the bar code.

17. The computer program according to claim 16, wherein the emphasizing includes emphasizing an amplitude of an edge based on
5 an excessive width of a black bar or a white bar in the bar code.

18. The computer program according to claim 15, wherein the emphasizing includes emphasizing an amplitude of the edge, when the edge data is expressed in a waveform with time on a horizontal axis
10 and an amplitude on a vertical axis, and when an edge having an amplitude greater than a predetermined threshold value is detected.

19. The computer program according to claim 15, wherein the emphasizing includes emphasizing an amplitude of the edge, when the
15 edge data is expressed in waveform with time on a horizontal axis and an amplitude on a vertical axis, and when an edge having a frequency of a module greater than a predetermined threshold value is detected.

20. The computer program according to claim 19, wherein the emphasizing further includes causing a change in emphasizing
20 characteristics that emphasize the amplitude of the edge, based on the frequency of the module.